

# "How to Build That Greenhouse You've Wanted Anywhere You Please"



No Skills? No Problem, You Can  
Still Build It Easy!...

*by Terry Clark*

## **Table of Content**

- 1. About Greenhouse Kits**
- 2. All About Solar Greenhouses**
- 3. Building Your Own Greenhouse - Cold Frames and Grow Racks**
- 4. Building Your Own Greenhouse - Greenhouse Designs**
- 5. Building Your Own Greenhouse - Storing Heat**
- 6. Buying a Used Greenhouse**
- 7. Buying Guide For Greenhouse Frames**
- 8. Choosing a Greenhouse Foundation**
- 9. Choosing a Site for Your Greenhouse**
- 10. Commercial Greenhouse Equipment Every Gardener Should Have**

11. Controlling The Temperature Inside Your Greenhouse
12. Custom-Built Greenhouse vs. Commercially Available Greenhouse Kit
13. Different Type of Greenhouse
14. DIY Greenhouse Maintenance
15. Greenhouse Building Tips
16. Greenhouse Electrical System
17. Greenhouse Fertilization
18. Greenhouse Foundation Ideas
19. Greenhouse Glazing Maintenance
20. Greenhouse Insulation
21. Greenhouse Lighting System
22. Greenhouse Panels - What and How Important are They?
23. Greenhouse Seed Propagation Tips
24. Greenhouse Supplies
25. Greenhouse Ventilation - Vents and Fans
26. Greenhouse Watering System
27. Guide To Buying Portable Garden Greenhouse
28. How Does a Greenhouse Work?
29. How Large A Greenhouse Should You Need?
30. How To Choose Which Greenhouse Materials To Buy
31. How To Store Portable Greenhouse During Winter
32. How To Use Your Newly Built Greenhouse

33. Hydroponic Greenhouses
34. Insulating The Base Of Your Greenhouse
35. Orchids Repotting
36. Planning Your Inexpensive Greenhouse
37. Portable Greenhouses
38. Selecting a Greenhouse Design
39. Should You Build or Buy Your Greenhouse?
40. Solar Greenhouse - The Active And The Passive Solar Greenhouse
41. The Benefits of Greenhouse Gardening
42. Water and Ventilation Systems for Greenhouse Plants
43. What are the Benefits of Greenhouse Gardening?
44. Winterizing the Greenhouse
45. Growing Green House - Cheap Greenhouse

## Resources

### About Greenhouse Kits

Greenhouse kits are available in different sizes, designs and forms, depending on your garden's needs and budget. You will need to know about each design to understand and pick

the right one that best matches your growing requirements. You may be surprised to know that some greenhouse kits are very affordable.

### Introduction to the Kits

Greenhouse kits provide you a finished and workable model. It is easier for individuals to get the right setup. There are a lot of DIY or do-it-yourself kits available for willing weekend warriors. You can get help from a carpenter to guide you through the entire process. Some reliable greenhouse companies provide you with technical assistance to help you through the project. You may be provided with a manual or videos to build the structure right. You should always look for a solid foundation where you are going to build your greenhouse.

### What to Buy

Look for a top quality door and frame. It is difficult to find just by looking at photos. If you want to purchase a certain kit, ask the seller to see a kit that is already set up. If you cannot view, look for other references that can provide you more information about the kit. Manufacturers generally provide several size options or you can order custom sizes on most occasions.

### The Kits

A lot of kits are made using either aluminum or wooden frames. Wood provides a very aesthetic effect but usually need a lot of maintenance. Aluminum greenhouses can be strong or fragile, depending on the model. Aluminum material can last for several decades. It, however, does allow cold outside temperatures inside the greenhouse. There may be thermal breaks done by the manufacturer to help alleviate this effect. A thermal break is described as the process of indirectly connecting the outside metal to the inner metal structures to make the internal environment warmer.

### **Solar Heat**

Some greenhouse kits are solar heated. This means that the setup you may buy can be more energy efficient compared to other models. You should try to choose an excellent solar design wherein the north wall is insulated. You have to insulate the foundation as well using Styrofoam measuring 1 foot deep. Use double or triple thick glazing for insulation. Seal all nooks to prevent air leaks. The doors and vents have to be caulked and weather-stripped. A number of thermal storages can work too. You have to find the right equipment and features that will give you the best warmth and temperature at the least cost.

### **More Features**

You can buy a number of kits that can be attached to a

structure like a garage or house. If you place the greenhouse on the south side of the home or garage, you can take advantage of solar heating. If you have a greenhouse linked or situated near the home, you can enjoy the greenhouse and find it economical to run operations.

### Compare First

Compare and review other features and options to add to the greenhouse, like vents, fans and paint options. Go for the best venting applications available, unless you are located somewhere with very cool summers. If you live in hot areas, you may find it difficult to adjust a number of things. You should choose the paint color that suits your personal taste. White reflects the longest and lasts the longest, which is why most gardeners prefer this.

Make it a point to ask the kit seller a number of things, such as the number of kits they have already sold, the warranties available, how long they have been operating and if they make the kits independently.

### All About Solar Greenhouses

Greenhouses come in a wide array of styles, types and materials. Today, people are becoming more environmentally friendly, by investing more in solar panels and energy. You will find that you can cut costs by investing in solar

greenhouses. These can be a worthwhile investment, since depend on a number of crops you grow for food.

### What is a Solar Greenhouse?

A solar greenhouse is described as a structure that houses plants and collects solar energy. Solar greenhouses have a specific purpose. It can store heat, utilizing this during the night when the temperature is lower. The heat can work well during winter, cloudy days and the cold season. You can provided the required temperature to the plants to sustain growth even during the cold months. The good thing about solar greenhouse setups is that you have several options that suit your specific needs.

### The Types

Solar greenhouses can stand independently. These are ideal for large production setups. The freestanding ones are excellent for commercial production. These can produce crops like herbs, vegetables, fruits and ornamental flowers. These usually appear in a couple of main designs namely the Quonset type and the shed type.

The Quonset type is described as a low-cost greenhouse. It appears like a underground pit with a tunnel and a Quonset-shaped frame. The setup has one or two layers of plastic film. This type can save you as much as 40% of heating fuel. The shed type incorporates a very long axis that runs from the east towards the west. There is a wall

facing south glazed to gather the maximum level of energy from the sun. The wall facing to the north is insulated to prevent loss of heat. The features help you determine the difference between a solar greenhouse from a traditional version.

### More on the Types

Solar greenhouses can be connected to the house if you choose the lean-to type. The attached solar greenhouse can be described as the structures that create some room that sticks out from the house. These are very good for growing herbs and transplants. The solar greenhouse can be classified as either passive or active. Either type uses various resources, but serves a universal purpose. Some places have longer cold months, so individuals have to rely on passive solar greenhouses, via an electric heating system or gas.

The plants can therefore be protected from the cold longer. You can maintain good production rates, regardless of the weather conditions. The use of heating systems of the setup can be very affordable and can be used optimally if there are crops of high value to be produced. The active setup uses supplemental energy, by transferring the solar heated air from the storage space to the other regions of the greenhouse.

### About the Design

Managing and keeping a regular greenhouse does not change much compared to the solar greenhouse. There are some features that matter, though. Solar greenhouses have oriented glazing to receive the highest solar heat, especially during winter. The materials are made to reduce heat loss. Heat storing materials are used. There is extra insulation when sunlight is absent. The solar greenhouse relies heavily on natural ventilation to cool the plants during extra hot days and the summer.

### Where Heat is Stored

The solar heat storage is the major feature when you design the solar greenhouse. There should be enough solar heat stored to keep it warm even during cold nights. The basic method used to keep the energy is to place concrete and rocks directly in the sunlight to keep the heat. Cinder block walls located at the north end of the greenhouse can be used to store heat. Dark-colored ceramic floors can be used to keep the heat. Flooring and walls not used for heat absorption needs to be colored lightly. This is done so that heat is reflected and light is properly distributed to all the plants.

### Proper Management

The amount of heat stored can be determined by the proper management of the greenhouse. The greenhouse full of structures and plants can keep heat easily. Composts can help the heat storage objectives, since these create carbon dioxide within the atmosphere. The microorganisms in the

compost give enhancements in plant production.

## Building Your Own Greenhouse - Cold Frames and Grow Racks

For homes with limited garden space and small apartments with small patios, cold frame greenhouses and grow racks are ideal. These are miniature greenhouses that are specifically designed where space is an issue or space and growing capacity are to be augmented. There are various design options that could fit an apartment or small houses. These greenhouses are designed as attractive additions to patios and walkways.

### **Cold frames structure**

A cold frame greenhouse is the simplest and sometimes the smallest of greenhouse types. Advantages of the cold frame greenhouse aside from being inexpensive are that it does not use any artificial source of heat. The heat that it uses is the heat that is filtered through the cover. The cold frame model is best at protecting and strengthening tender flowers, herbs, and plants, an interim growth and cultivation environment if you will, before they are transplanted outside. It is good at protecting sensitive plants during winter and cold months. Even when cold frame greenhouses are generally designed to be small, they are good at supplementing spaces for big projects. When not in use cold frames could be used as storage for garden supplies and seeds. Many cold frame structures are designed with

single or double poly coverings that are easy to assemble and disassemble.

Cold frame structures are designed for basic plant protection only and are not recommended in areas where there are extreme weather changes and are very windy. The cold frame model is not ideal for growing exotic and delicate plants year round as these types of plants need requirements that closely approximates its natural environment. For temporary sheltering and caring of plants however, cold frame greenhouse structures have advantages.

### **The Grow Racks**

Grow racks are mini greenhouses next in size to the cold frame type. For the plant enthusiast, these types are designed to be affordable, practical and low maintenance. They are constructed to be lightweight, compact and portable to fit limited spaces. Grow racks are often designed to accommodate adjustments or removal of shelves. The tiered design enables the gardener to make adjustment on the requirements of the plants that are currently grown. The steel frames of this greenhouse type are painted, and are covered with Velcro to keep the humidity and the heat in. The Velcro is fitted with zipper for adjustments in the temperature.

Greenhouse styles are variations of the greenhouses designed to fit every need and space availability. The following are examples:

### The Solar Greenhouse

There are two kinds of solar greenhouses. First is the active solar greenhouse that uses photovoltaic systems to collect solar heat and energy to maintain ideal greenhouse temperatures at night and during cold weather. Another advantage of having a solar greenhouse is that it enables the gardener to grow virtually all kinds of plants depending on its heat requirements. The other kind is the passive solar greenhouse. This type of green house is less expensive to operate. Often, barrels of water are used to store up the suns energy and then the heat is dispersed inside the greenhouse as the temperature cools down due to the principle of heat transfer.

### The Pit

The best advantage of the pit greenhouse is that it uses the wall of the ground as natural insulators. In areas that are prone to bad weather and where the wind could be high, the pit greenhouse is an ideal design. To make a pit greenhouse effective, the pit should be at least five feet from the water table. The walls are lined with wood or other materials. Drains are built to direct the water from the greenhouse and keep it dry. This design is one of the best in providing minimal heat loss.

### **The A Frame**

This greenhouse type called because of its slanted sides. Depending on the degree of the slant, the A Frame could handle snow and could be more expensive to heat. The A frame type though are strong greenhouse structures.

### **Modified A Frame**

The roof of the modified A frame is not as steep as the A Frame. It is constructed like a typical house except for the eaves. It provides more space as it has walls. Due to the design, the heating cost is less.

### **The Barn**

The design is very similar to the modified A Frame except for the gambrel roof. This design is efficient in conserving heat. The walls allow good space utilization.

### **Quonset Hut**

The structure is semi circular like a military shelter. The design makes the greenhouse easy to heat and is also efficient at heat conserving. Polyethylene and sheets of polycarbonate are used because of the hoop style structure.

It is very easy and inexpensive to heat.

### The Gothic Arch

The design is a variation of the Quonset hut except for the pointed arch and the sides that are straighter.

Aesthetically, greenhouses with Gothic arch are pleasing to the eye.

### Building Your Own Greenhouse - Storing Heat

In many greenhouse cases, heat must be stored to keep the temperature of the greenhouse as constant as possible. This is more so if plants require warmer temperatures than your location cannot provide, particularly during the winter or after the sun sets.

For storing heat, you could use water, rocks, or concrete exposing this to direct sunlight. These materials will absorb heat that you could use later. If you use bricks, tiles, or rocks remember that the darker the material is the more capacity it has for storing heat and that the heat will penetrate four inches of rocks piled on top of the other. The heat stored is then radiated throughout the greenhouse when the temperature drops. When using rocks for heat storage, use rocks that are about + to 1 + inches in diameter as it has better surface area ratio. Pile the rocks in a wire mesh to contain them.

If you want to use water to store heat, use ordinary 55-gallon drums. Paint the drum dark and fill with water placed in strategic locations inside the greenhouse. Water absorbs and disperses heat that is ideal for greenhouse use. You could use smaller jugs and water containers. Smaller water containers are even more effective than large water drums due to its higher surface ratio that enables it to absorb heat faster. Plastic containers are good except that it degrades after a few years in contrast to glass water jugs.

Using trombe wall are also efficient ways of storing heat. If a trombe wall is required for heat storage, construct the walls facing the southern side of the greenhouse to absorb the most heat during the day. You will need about six inches of masonry constructed outside the greenhouse, connected to one of its walls. Coat the wall with a dark color to maximize its ability to retain heat. The heat conserved inside the trombe wall is then radiated into the greenhouse through small outlets in the greenhouse wall. The trombe wall is very useful especially during drops in temperature.

A variation of the trombe wall is the water wall. While the trombe wall uses masonry to store heat the water wall use water containers and water bags instead. The water-filled bags are placed between the working space and the glazing inside the greenhouse but are exposed directly in the sun's rays. The water inside the tubes, jugs and containers absorbs the heat and is dispersed slowly throughout the night.

## Buying a Used Greenhouse

Greenhouse gardens have become quite rampant nowadays as more and more people realize the potential and benefits. You will find that there are plenty of choices available when it comes to building greenhouses. You can save more by buying a used greenhouse instead. Even beginners can learn if they have true green thumbs by investing in these. Here are some tips and guidelines.

### **The Sources**

You can find excellent used greenhouses at local hardware stores and surplus shops. Check out the garden tools and equipment section then look for setups that may only be a few months old. You can look for local greenhouse gardeners, if you know any, then ask them about the different greenhouse setups that they have available. The good thing about used greenhouses is that these are very cheap and affordable. You can get bigger discounts by talking to people you already know and sorting out the best dealers in the area.

You can go to your local hardware store and ask if they have any used greenhouses. In most cases, you might be referred to portable types that are only 2 to 6 months old. These are usually grown by hobby gardeners and beginners who have already moved up in terms of skill and invested in bigger and more permanent setups.

## Features to Look For

Since you are dealing with used greenhouses, it is important that you look for quality and durable materials that will last for more months or years to come. The most durable material is stainless steel or aluminum. These do not get weathered and are free of rust and other damaging elements, regardless of what these have been through. You should check the panels and invest in the best quality materials. Try to look for double or triple glazed panels that can stand and stay intact for several years. These may be made of polycarbonate or glass.

Check the insulation and what temperatures to expect during certain periods of the year. All equipment and structures should be maintained even if these are second-hand. You should consult the experts about details and which things to look at when observing used greenhouses.

## About Price

The price of used greenhouses will differ, depending on the model, systems used, age and the materials used. Expect to pay 25% to 70% off on used models. Some of the factors that determine price are the current quality and condition, the size, materials and other functional systems. You should consider other inclusions that might jack up the price, like availability of a warranty, repair and maintenance privileges, etc.

## **Handy and Useful**

You can buy used greenhouses by the part. This comes in very handy and useful, especially if you already have an existing one and only need to upgrade. Some parts are very affordable, especially if you purchase online. There are hundreds of independent sellers who would be willing to sell or trade the items at a fraction of the cost, compared to brand new versions.

## **How Much to Pay**

A used greenhouse with all the basic and standard features and materials will cost you around \$2,000 to \$3,000. You can save more by purchasing from different sources. For example, you can buy standard size panels from one manufacturer and flooring from another. You should compare prices and look for the best value to get the most out of your hard-earned money. Make sure you include all the details during the payment, such as packaging, shipment, repairs, insurance and warranty. These can equate to added cost and expenses.

## **Creating Rapport**

Once you find a reliable source for used greenhouses, you have to establish a solid reputation and build rapport with the seller. It is very likely that you will still be going

to him for more materials and used setups in the near future. Used greenhouses are available depending on the system and type you want and the season. Some setups are more popular during hot months, while others flourish during the cold season. Maintain communication with expert gardeners for more info all year round.

### Buying Guide For Greenhouse Frames

Greenhouse frames are often the material that is given the least importance. In fact, choosing a greenhouse frame is often a matter of preference. As for frugal buyers, it is a matter of which material is the most affordable. However, there are still important points you need to realize before checking out either the cheapest frames or the best-looking frames your money will allow. Let us take a look at the high points of the most popular materials for greenhouse frames.

#### **Metal**

Metal greenhouse frames are often available for pre-fabricated greenhouse kit. These materials are somewhat lightweight, durable, and flexible, making the greenhouse movable. Metal frames are designed for a quick set up and tear down. The best thing about metal is that it absorbs, stores, and releases heat or cold gradually over time, making it very ideal to help keep temperature inside the greenhouse constant. This quality is often the best selling point of metal frames.

While you will not be having any termite problem with metal frames, rusting will be your biggest enemy since they are exposed to constant moisture. Covering your frames with layers of paint can significantly increase their lifespan.

### Wood

Wood frames are widely available at any hardware store, large or small. Wood is easy to work with, very affordable and can be used by anyone even with the most basic of carpentry skills. With a blueprint, woods that are cut in their respective lengths, and few important tools such as a hammer and nails, virtually anyone can build greenhouse frames. However, wood has a limited lifetime. Even treated wood rots over time. Termites are also your enemy when you use wood as greenhouse frames. These critters can eat away your frames long before you even realize it. If you leave in an area where termites thrive, it is recommended to call for an exterminator or choose another material for your greenhouse frames. If you are a beginner who does not want to invest too much on a greenhouse, wood frames are the most practical choice.

### Plastic

Plastic frames do not rot like wood and do not rust like metal. They are very strong, durable, lightweight, easy to cut into right length, and easy to bend with the use of heat. Even exposed to elements over a long period of time, plastic

frames stay as they are. The major drawback with plastic frames is its price. Plastic tubes are expensive as the cost of processing and recycling plastics is high. If you want a low maintenance, high quality, and durable frames, this is for you.

### Choosing a Greenhouse Foundation

When building a greenhouse, the foundation where the structure will sit should be considered carefully as it can affect the growth, health and maintenance of your plants.

Concrete is the most certain choice. It is solid and can hold the weight of a heavier greenhouse structure. Concrete absorbs moisture every time you water your plants or clean the floor. This is important when regulating the humidity inside. Concrete acts as a thermal mass, it can absorb, store, and release heat slowly overtime, helping your heating system in regulating the temperature of your greenhouse. But there are drawbacks. Concrete is only good if you want a permanent structure. If you want to move your greenhouse to get sunlight as seasons change, this will not do. Concrete requires a little maintenance since it is porous and can attract weed, bacteria, and fungi to take hold and grow. Plus, expansion may be a little harder if your existing greenhouse is cemented on the ground.

Soil or dirt foundation for your greenhouse is a good choice if you want to grow your plants right off the ground. Just

make sure that you provide proper drainage so that your soil is fertile for your plants and vegetables to grow. Drainage is important to draw excess water out and keep the soil from turning into mud. Soil is a good moisture absorber too, helping you regulate humidity inside the greenhouse. If you live in a colder climate and choose soil as foundation, insulate the border of your greenhouse with thick insulation materials at least two feet deep. This keeps the cold air, pests, and rodents out.

If you going to choose wood as your foundation, limit your options to decay-resistant cypress, redwood, and cedar. The site should be first leveled and layered with gravel and sand for drainage before laying down your choice of wood.

Synthetic materials are lightweight, easy to install, easy to replace, and readily available in the market. This is best suited as flooring for portable and small greenhouses. However, PVC and plastics do not absorb water so it needs to be cleaned and dried regularly. They can also break or crack, especially if exposed to excessive weight overtime.

The choice of greenhouse foundation is still up to you and everything boils down to your requirement and need. Always remember, therefore, to consider the pros and cons of each before deciding which foundation to use.

### Choosing a Site for Your Greenhouse

When you were searching for a home, it was the location that had the greatest weight in your decision. When building a greenhouse, location is still the thing that matters the most. While you don't need your greenhouse to be near a school, a church or a grocery store, you want your greenhouse to sit perfectly in your property where it serves its purpose most and where it can be accessed easily.

Choosing the right site is not that hard. All you have to do is to ask yourself the following questions:

1. How large (or small) is my greenhouse? Obviously, you will erect your greenhouse where there is an ample space around it. Make sure that you have plenty of room between your greenhouse and trees, walls, fences, and buildings.
2. Is there enough light in that area? A degree in agriculture is not required for you to be able to know that light plays an important role in your plants' growth. Make sure there are no obstructing buildings, trees and fences that would block the sunlight. It is ideal to build your greenhouse with a door facing north and no obstructions on either side so that it gets plenty of sunlight throughout the day.
3. Is it near a water supply? Plants need water to survive - you already know that, right? So make sure that you build your greenhouse near a water supply or else, you will find yourself making several trips back and forth to the water hose.

4. Does it have a drainage system? Since you are going to need a lot of water, you need a good drainage system. The last thing you want is to stomp around a pit of mud while trying to perform your daily duties in your greenhouse. Drainage does not have to be sophisticated. Setting up layers of rocks and sand over mulch will work just fine.

5. Is the future location of my greenhouse free from trees? Yes, trees. We've mentioned this already, but it has to be repeated to that it will stick on you. Unless you want to worry about lack of sunlight, tree branches that can do damage to the structure, and leaves getting on top and staying on top, keep greenhouse away from trees!

The key here is planning. Study your property well while fulfilling these questions and you'll find the perfect spot for your greenhouse in no time.

### Commercial Greenhouse Equipment Every Gardener Should Have

Sustaining an efficient greenhouse is more than just building the structure and putting plants in it. It takes patience, dedication, and investing on the greenhouse equipment to make gardening much easier. Here are the top commercial greenhouse equipment gardener of all skill levels should have:

1. Heating system - Growing plants in a controlled environment is much complicated than planting the right greens at the right season. In a greenhouse, plants should have a relatively constant temperature to ensure that they grow healthy, especially during the winter season. Keep the temperature tropical-warm inside your greenhouse even if it is in the middle of a snow storm with a good heating system.

2. Water system - The primary requirement of plants in order to survive is water, which can be naturally received from rainfall. But if plants are in an enclosed environment and not getting any amount of rain, you need to supply them with a constant supply of water. Without spending a dime, you can water your plants by spraying them with a hose. If you have a larger greenhouse you better have one of the several commercially available water systems to make the task easier.

3. Thermometer - Regulating temperature inside the greenhouse is an important requirement for plants to grow healthy and to stay alive. Install automatic temperature controller that is attached to a ventilation system or a heating system to keep a relatively constant heat inside the greenhouse even without your intervention. Automatic ventilation and heating systems keep the most suited environment for your greenhouse plants.

4. Greenhouse staging - All greenhouse plants may be placed on the ground. That is not the normal practice, first it is not good for the eyes. Second, it makes it hard for you to monitor each plant. Last, it is a bad idea if you

are maximizing the space of your greenhouse. Use greenhouse staging that is both sturdy and hard wearing all throughout your greenhouse.

5. Seed tray shelf - The idea of using seed tray shelf is to maximize the space in your greenhouse. A seed tray shelf stores all your newly planted seeds in one location, away from grown up plants that have different water requirements. In other words, it serves as the nursery section in your greenhouse and at the same time, it helps save space.

### Controlling The Temperature Inside Your Greenhouse

Incorrect temperature and airflow inside the greenhouse results in withering, diseases, and stunted plant growth. There are four components to control the temperature inside the greenhouse.

Ventilation - this is achieved by having vents in the greenhouse. Vents could either be a combination of roof vents, side vents, and the door. While roof vents are good at releasing hot air that rises to the roof, side vents are needed to increase low level ventilation. Side doors could be good ways to manage airflow but often, this will not suffice especially in areas where there is high humidity and hot temperatures. Typically, greenhouse manufacturers install the correct number of vents in the greenhouse if you choose not to build your own.

Ventilation that is operated manually is good for small greenhouses though most greenhouses today especially those that are fairly large are equipped with automatic ventilation systems that are thermostatically controlled. This way guess work regarding weather conditions are eliminated and the green house is maintained at its optimum temperature as required by the plants.

Fans - are needed to bring the warm air back into the plants for fresh supply of carbon dioxide. Stagnant air inside the greenhouse causes mildews and other plant diseases that you would want to avoid. The roof will need an additional fan for air stratification. Pulling down the warm air back to the plants is even more important during cold seasons for maintaining warm temperatures. Installing a roof fan reduces heating costs. In many areas, proper ventilation and fans alone will not complete the cooling of the greenhouse; misting and shading are needed.

Shading - Shading is needed to make adjustments in the plants exposure to sunlight. While too little shading could cause the plants to reach out for more sun, too much could wither it. Shading will depend largely on the kind of plant that is grown of the local climate and the design of the green house. No matter, a shade that is easily placed on the roof will give you better control of the plants exposure to the heat of the sun especially when the plant that is being grown at the moment does not need much of it.

Misting - Vents, Fans, and Shades are tools that helps you

control the greenhouse from overheating but misting is what maintains comfortable temperatures. The evaporation of water inside the greenhouse plus the air circulation by the fans carries the moisture necessary to maintain the health of the plants inside the greenhouse.

### Custom-Built Greenhouse vs. Commercially Available Greenhouse Kit

Different people have different reasons why they want to have a greenhouse. Some may have the gift for growing their own food. Others love to have certain seasonal crops all year round. Some just love the feeling of having their own food garden right at their backyard.

Having your own greenhouse is and will always be a very good idea regardless of your reason. But when the time comes when you are already taking into considerations all the building factors such as budget, space, and your building skill, you are caught up with the dilemma of having to choose between two options. Will you start from scratch and build your own greenhouse or will you buy a readily available greenhouse kit to save you all the trouble of buying every tool and materials you need? Let us take a look at the key points of each option to help you decide which one you will choose.

**Do-It-Yourself Greenhouse** - One of the best things about building your own greenhouse is you get the chance to pick all the materials you will use, choose what type

construction you should do, customize its size and shape, and tap a little bit of your engineering skill. You can pick from wood, to PVC pipes and match them with the materials that are readily available at your home. You can construct lean-to greenhouse, classic or modified A-frame, barn-style, Quonset hut, Gothic arch, or even solar greenhouse. But while instructional videos and articles are all over the web, not everyone can build a greenhouse from scratch. It takes some skills to actually finish a decent-looking greenhouse. Cost can be a factor too. If you don't know what you need or how to pick the right material, your budget may skyrocket until you no longer afford to complete the construction. But if you are a natural handyman, then this option is perfect for you.

**Greenhouse Kit** - This is a good alternative if you lack the skill to build a greenhouse from scratch. It is usually made of metal frames and heavy-duty polyethylene sheeting. Greenhouse kit is portable, economical, and very convenient for most homeowners. It is easy to assemble or disassemble and move around whenever it has to. A larger greenhouse kit is obviously not so portable especially if you don't plan to keep it standing all year round. However if you want to keep it erected, just make sure that you choose one that is suitable for the weather in your location.

### Different Type of Greenhouse

Once a greenhouse has been decided, the next question is the type of greenhouse that will be built. There are

basically two types of greenhouses: the freestanding, and the attached (or lean-to) greenhouse. The following are descriptions of different types of greenhouses. One could possibly be in your garden very soon.

### **Freestanding Greenhouses**

A freestanding (or stand alone) greenhouse is an independent structure not attached to a preexisting structure like the house or an existing wall. Freestanding Greenhouses have the distinct advantage of being positioned in a place where sunlight could be used to best advantage. It could be built to as large as the grower would want it to be. Depending on its size and gardening that it is intended for, it will require larger investment.

There are two typical freestanding greenhouse models.

#### **The Portable Greenhouse**

Portable greenhouses come in different sizes and are typically made of metal frames. This greenhouse type is ideal for hobbyists'. Being portable, this greenhouse model could be disassembled when not in use. There are portable greenhouses that are larger depending on the use that they are intended. There are portable greenhouses made to withstand weather conditions depending on the locality of the grower and could be used year round.

#### **Permanent Greenhouses**

Although they come in different sizes, permanent greenhouses are best for the avid gardener who wants a greenhouse that offers a wider range of gardening options. Permanent greenhouses usually come with kits that the gardener can put together. They are also the sturdiest of greenhouse models and could take a while to assemble aside from needing extra hands to assemble them. When choosing a permanent greenhouse, it is well to decide the kind of gardening including the variety of options that the gardener wants because an avid gardener could usually run out of greenhouse space quickly.

### **The Attached Greenhouse**

Like the permanent greenhouse, lean-to is considered as a permanent greenhouse although it is attached to an existing wall, a garage, a fence or some other permanent structure. While an attached greenhouse is limited by the structure when it comes to best exposure to sunlight, when constructed in the right spot, it has the advantage of being accessible to plumbing and electricity. A Lean-to does the functions of a permanent greenhouse and due to its usual proximity; it is the most accessible during bad weather.

### **DIY Greenhouse Maintenance**

Regular maintenance is essential to keep it in good condition for as long as possible and to keep a level of

cleanliness and hygiene inside the greenhouse.

**Checking the panes** - Routinely inspect windows, doors, vents, and covers of your greenhouse, especially after high winds or after a storm. Cracked or broken panes should be replaced immediately to prevent endangering you and your plant, and to avoid losing heat and humidity inside your greenhouse.

**Check the frames** - Wood frames, treated or not, should be checked regularly for termites and decay. Check for rusting if you use metal frames. Repair rusted metal to prolong the frame's life and make sure to coat exposed metal with layers of paint to stop metal deterioration.

**Clean the floor** - Concrete floor are easy to maintain. Sweep any dirt or dry leaves first and hose the entire area with water. Use mild soap and scrub to remove stains or stuck objects from it. Make sure that you have a good drainage system, especially if you have gravel or wood flooring to draw out any excess water as a result of daily watering. Dirt flooring can turn into mud if you do not provide sufficient drainage system too.

**Clean the panes** - Use warm water and sponge to clean the outside panes. It is best to do this during a fairly breezy day. Let the wind dry the glass panes without leaving too much watermarks on the surface. Clean the inside panes using warm water and sponge as well. If the outside temperature is not too cold, take the plants outside to better clean the interior panes. This is the perfect time to inspect each

plant for damaged or infected leaves and discard plants that are dead or dying.

**Equipment maintenance** - Essential items such as ventilation, irrigation and heating systems should be checked regularly to keep the environment inside of your greenhouse working properly. Any damage should be repaired immediately. Containers, capillary matting, staging, containers and pots should be sterilized regularly to prevent disease and lower the risk of infestation. Insulation should be checked for leaks to prevent unnecessary heat loss and to keep pests and rodents out.

Cleaning the inside of the greenhouse regularly not only provides a healthy living environment for your plant, but gives you with a clean and pleasant place to work. Regular maintenance meanwhile, extends the life of your greenhouse and keeps you from future repairs.

### Greenhouse Building Tips

There are various reasons why greenhouses are built. A continuous supply of greens for winter, developing parent plants for the next crop, protecting young shoots started from seeds, experimenting to develop a variety, and culturing of plants to make them available at any season. Whatever the reason though, the following are greenhouse building tips that are typical for all greenhouse buildings.

**Area** - the area chosen must be as leveled as possible but with enough provision so that excess water drains efficiently.

**Light** - Plants need sunlight. The greenhouse then must be oriented in such a way that it receives as much sun as possible. The temperature or the sun that the plants need must approximate those that it receives during spring. In winter, that is not very easy to do. What you need to do then is build the greenhouse in a clearing where there is no obstacle to sunlight exposure.

**Temperature** - different plants have different temperature needs. Too hot and the plants wilt, not enough sun and the plants does not grow. Keep a thermometer in the greenhouse instead and regulate the temperature through ventilation. An alternative is to hose the ground and open the vents to lower the temperature inside the greenhouse.

**Ventilation** - Greenhouses heats up fast especially during summer. In the southern parts this is more so. Know the temperature that the plants thrive best and monitor and regulate the temperature inside the greenhouse accordingly.

**Workspace** - provide sufficient space inside the greenhouse so that the plants are distributed evenly with enough space between them instead of bunching the plants together. The space should include sufficient moving room for you to work

or a walkway in between plants, for the tools to be kept and for a sink to be installed.

**Irrigation** - Too much water will drown the plants. The only time that water is needed inside the greenhouse is when the soil is dry, other than that the plants will do fine. Many greenhouses owners prefer hand watering of plants. For seedlings though the best irrigation is the drip system as it is gentle on seedlings and small shoots.

**Maintenance** - different greenhouses have different maintenance requirements. Common to every greenhouse though is the regular disinfection of the entire greenhouse. When disinfecting, use a water/disinfectant solution to spray walls and everything else inside the greenhouse except for the plants. Keep all vents open to allow the fumes to escape. Disinfecting the greenhouse limits infestation of spiders, flies and other insects that could hurt the plants.

### Greenhouse Electrical System

Greenhouses need to make everything very efficient and economical to last for several seasons and years. You will realize that having a good electrical system will also help other systems work better, such as the watering system and the lighting system. It is important that you consider all safety measures possible, to make the experience fun and productive. Electrical systems are available depending on

the kind of setup you wish to ensue.

## Electrical 101

It is important to understand that having a good and reliable electrical system will make your entire greenhouse gardening experience easier. You get to control lighting, watering, fertilizing and ventilation well by having the right tools and equipment. The plants ultimately benefit from the adjustments and can grow at the right temperature and conditions, regardless of the current season. Plants can grow optimally and you can grow seeds at different times of the year, thereby boosting your produce on a yearly basis.

### About the System

The electrical system is considered by majority of gardeners to be the most important factor among greenhouse systems. Electricity is the primary element required to fuel all other feasible devices like the humidity gauge, the temperature gauge, lighting fixtures and all other equipment that runs on electricity. Some greenhouse systems include an adjustable off and on button that controls the flow of electricity inside the region. It may have an independent timer switch that instantly shuts off when no other device is in use at that certain time.

### Installation

One of the main advantages of a good electrical system is the low-voltage timer and electricity power line. The optimal level of voltage for majority of electrical systems is just 150 watts. The amount of energy used to power all important devices is actually very little, so you do not need to worry about having to pay several hundreds of dollars in utilities each month. The greenhouse systems can be easy to install, depending on the type. There are some very easy systems that can quickly be mounted, even without the help of an expert electrician. Small greenhouses are usually the most common investors of mounted electrical systems.

### On Heaters

You will need electricity to power different heaters for the greenhouse. Insulate the greenhouse first. Seal all visible cracks and look for drafts. You can put thermal screens along the walls. These can be used to divide areas that need heat from others that do not need it, thereby lowering your expenses on heating. The top area of the greenhouse can also be blocked using the thermal screens to keep hot air recirculating to the ground.

The heat required to keep the greenhouse at constant temperature has to be calculated. A BTU or British Thermal Unit can calculate the level of heat needed to increase the temperature of a single pound of water by 1 degree F. The common formula used by gardeners is either the roof area or the wall area, multiplied by the temperature difference

between the outside and inside of the greenhouse.

### Where to Get the System

First, consult an expert electrician about the perfect setup that will best work for your current gardening needs. The electrical system should cater to all other existing devices that feed on electricity. You can get help from the expert so that you are not paying for unnecessary expenses. The professional may need to measure the total size and area of the greenhouse, as well as check the available devices to know which is the best electrical system to use.

### Getting Materials

You can acquire materials from your local hardware or electrical shop. You can order online. You can start purchasing by the part or purchase full systems that can easily be installed. You should test the functions and buttons at the start and observe the effects for a few days, until you master how well it can maintain the temperature inside. You should check where best to position the system, so that it stays protected against moisture, water and extreme heat. Talk to other greenhouse gardeners online to help guide you throughout the entire process.

### Greenhouse Fertilization

Plants need fertilizer to grow to optimum levels. However, if you are growing a greenhouse garden, you will need a certain style and technique to get the job done. There are a number of approaches that will help you get the best results, without having to spend too much time, money and effort. It is equally important to sort out the different resources, so you can save more. Here are some tips and tricks used by experts.

### About Fertilizers

Growers use bulk tank systems or injection systems to create the same choices when determining fertilizers. The first choice depends on the use of either commercially blended, premixed fertilizer, or individual fertilizers. You can weigh each to get the desired level of every segment. Self-blended or premixed combinations can be used with either bulk tanks or injectors. The benefit of a premixed fertilizer is primarily convenience, since the right ingredients are already mixed to the right proportions. The grower just weighs then dilutes the right amount of fertilizer in the water in the concentrate or bulk tank.

Individual fertilizers, provide the grower the added flexibility of choosing ingredients to focus on the fertilization program. An injector system will best for this approach, although the process is still effective using bulk tanks. Buying fertilizers for individual ingredient use is more cost-effective compared to premixed kinds.

## About the Bulk Tank

The bulk tank system incorporates a big tank made of steel, plastic, concrete, PVC or polyvinyl chloride, etc. to hold the dilute fertilizer solution. The diluted solution is directly pumped into the growing medium with no added dilution. The injector system includes a small tank that holds very concentrated solutions of fertilizer. The small injector pump measures the concentrate into the water supply line whenever the plants are watered.

## Which Tank to Get

One greenhouse bay can be sufficed with a 100-gallon tank, while many greenhouses will have to depend on a 2,000 gallon tank. The bigger the tank, the less frequent you need to fill it. If the tank is too big, it takes some time for it to empty. You will then delay adjustments to the mix as necessary. For new growers, the bulk tank system is more convenient and leads to less mistakes.

## About the Premixed Type

When you get premixed fertilizers, you will also get mixing and use directions. Mixing fertilizer involves adding several units of dry fertilizer for every volume of water. The fertilizer should be fully dissolved in water, because settled out fertilizer or precipitate cannot reach the

growing plants. It may be needed to stir the solution using a circulation pump, paddle or an electric mixer. If precipitation is difficult, the fertilizer can be premixed using a small amount of hot water. You should provide proper care to check the EC or electro conductivity and pH of the solution whenever you mix a new batch, to add extra protection for mistakes.

### Using the Injector System

An injector or proportioner is used to dilute the fertilizer solution when using an injector system. The cheapest and simplest form of injector is the siphon hose proportioner, usually included for fertilizing garden plants and lawns. The siphon hose includes a non-adjustable ratio of 1:16 and is not ideal for commercial production of greenhouse plants. There are different model available depending on your budget and preferences. Accuracy often determines the price of injectors. Affordable types have varying injection ratios, based on the water pressure. The fertilizer solution can be pumped straight from the concentrate tank to the injector, being diluted in the water stream and towards the blending tank. The irrigation system is the last stop.

### Knowing the Limits

Fertilizers can fully dissolve. If it does not, it can leave precipitates in the tank and plants will lack proper nutrition. Solubility limits are described as the maximum limits as to how much of the fertilizer can dissolve in

water. Putting too much fertilizer in a volume of water will only leave precipitates, and plants not getting the right dosage. Solubility limits may not be a hindrance for a number of fertilizers used in growing tomatoes in a greenhouse. Potassium nitrate and potassium sulfate, however, may experience problems.

### Greenhouse Foundation Ideas

Building the greenhouse foundation is not just the very first stage in greenhouse construction; it is the most important stage of the entire project. Just like a house or a building, the structural integrity of the greenhouse depends on how the foundation is built. A good greenhouse foundation provides sufficient insulation and protection against pests and rodents.

The construction of greenhouse foundation depends on the type of greenhouse you are going to build. Greenhouse kits, especially the larger types, have specifications and defined measurements for their foundation. Construction of greenhouse kit foundation is simple and straightforward since its dimension is given. DIY greenhouse foundation varies depending on materials used and the average temperature of your location.

The most common greenhouse foundations are made of concrete slab, a knee wall, and wood. In cold climate, the best option

to use is a concrete slab foundation. Next is a pier type foundation where the foundation is built on a combination of timber on concrete columns. For foundation constructed above the ground, and greenhouses that would use wood instead, the best bets are cedar, redwood, or wood composites for the sill plates. When using wood for foundation, it is best to check the tags of the wood to determine the suitability of the material that you are having. Wood corrodes but when specified to be used as foundation, wood are chemically treated. Chemical treatments will determine whether the wood is for use above ground, for ground contact, for burying in the ground or for burying in ground with high alkaline content.

Nonetheless, the greenhouse foundation has to be insulated. This is typically done by lining the outside wall with foam insulation the depth of which will depend on the climate of the area. No matter though, the idea is to retain as much heat inside the greenhouse as much as possible.

The depth of the greenhouse foundation should be based on the temperature of the region since cold air can seep through soil and below the ground level. For areas where there are extreme drops in temperature during winter, the foundation should be below the frost line. In colder climates, insulation should be a few feet down. For the rest, few inches will do except when the intention is to use the wall of a pit as insulators.

When these requirements are considered and have been satisfied, the greenhouse could be started.

## Greenhouse Glazing Maintenance

There are two factors that are critical to maintaining a correct amount of solar heat that is maintained inside the greenhouse. The first is the orientation of the greenhouse to the sun; the next is the efficiency of glazing that is used.

While the orientation of the greenhouse as it relates to the sun enables it to have the potential solar heat that could be used, the glazing on the other hand is what allows and keep heat and light in the greenhouse. In choosing a glazing material then, the rule of the thumb is to choose a material that could let solar heat in while preventing heat loss as much as possible. Heat loss and control are managed by the ventilation system and its components. Glazing is what absorbs and keep it.

Minimizing energy loss has been a subject for greenhouse developers and designers that there are several choices and variants that you could use for this purpose. Typically glazing materials should allow natural photo synthetically active radiation to be absorbed into the greenhouse. For this, treated double-layered plastics, rough glass, and fiberglass are used. While plastics are the most common, the component that makes all the materials even more effective are enhanced weather ability, ultraviolet degradation inhibitors, radiation transmission properties, and infrared radiation absorbency.

In some areas, greenhouse growers add additional glazing for the greenhouse during winter. Materials that are used are thermal films that create additional insulation to retain the heat. In areas where winter cold could be severe, double and sometimes triple layer of films are mounted for added heat retention.

The manner of mounting the glazing material too will determine the amount of the heat conserved or lost. Holes and cracks during the mounting will allow heat to escape while spaces in between the mounting will affect energy retention.

In the installation of glazing, it is well to note that while plants grow well both in direct and diffused sunlight, the glazing of the greenhouse must allow adjustments so that there is an even distribution of diffused light to all the plants as much as possible. The structural supports of the green house could often get in the way of sunlight, that the result would be plants that are healthier and more developed in most areas while those where the supports of the greenhouse are obstructed by the frames are stunted.

### Greenhouse Insulation

A method that is popularly employed in building of greenhouses to retain heat is insulation. To keep the heat in, insulate all areas within the greenhouse not intended

for heat absorption. To retain the most heat, internal and external insulation are done.

### Insulating from within

All the areas that are not glazed must be insulated to keep as much heat as possible within the greenhouse. Seal openings like doors and vents with weather strips to prevent heat from escaping through these openings. When mounting the glazing, insure that it is fitted snuggly in its casements. Fiberglass butt, polystyrene, and polyurethane foams are good insulators although to function well, these materials have to be kept dry. Mounting a polyethylene film between the walls of the greenhouse and the insulation will enhance the capacity of the greenhouse in keeping the heat in.

### External Insulation

There are two types of external insulation. When the greenhouse is built on ground level, insulating materials for example, bales of straw, are placed along the wall that are unglazed to prevent the greenhouse from losing heat. Other greenhouse growers build the greenhouse using the side of a south facing hill for natural external insulation. Still other greenhouse growers build their greenhouse in a pit using all the walls in the pit as natural insulators. Underground greenhouses have the best natural insulators, as heat loss will be very minimal. Greenhouses that are built underground provide perfect protection against wind and bad weather. The only possible problems with greenhouses that are built underground are the seeping in of water when the water table is breached. Growers that prefer to use the ground as its insulator minimizes this

risk by building the greenhouse five feet above the water table and creating drains outside the green house to redirect the water away from the walls.

### **Greenhouse Curtains**

These curtains are insulation sheets made of polystyrene that limits the heat lost through the glazing by as much as 90%. For small greenhouses, these curtains are installed manually and removed in the morning with ease. To facilitate installation, the curtains are furnished with magnetic clips and Velcro fasteners. For larger greenhouses, thermal curtains used are foil backed polyethylene materials, foam backed fiberglass and polyethylene bubble material. Pulleys are used to raise or lower these thermal curtains. Some manufacturers fix their thermal curtains with electric motors to roll the blankets up or down, well suited to larger greenhouses.

### **Greenhouse Lighting System**

Light or sunlight is one of the most important factors that you need to perfect when growing in greenhouse. The lighting system should be properly functioning and distributed according to the different needs of the vegetables, herbs and flowers that you are tendering. You will find that you need various tools and fixtures to accomplish this successfully. Greenhouses will give your plants the right temperature and light anytime.

## About Light

Light is one of the most basic components of life and plant growth. Absorbing light leads to warmth provision and several rays of light that will ultimately lead to growth and development. The bottom of the food chain is full of little organisms that live on the energy created from photosynthesis. Sunlight triggers growth of the smallest organisms and is one of the most vital parts of the greenhouse process. Gardeners make the mistake of believing that they need to use up all the available light to boost plant growth. It is important that you understand proper diffusion of light and realize the true needs and requirements of your own plants.

## Diffusing Light

Light diffusion is described as the scattering of light waves. The small intense light beam will break and disperse light waves over a wide area. The scattered lights actually stems from several directions, instead of just a single point. If you drive in very heavy fog, you will appreciate the effect of light being diffused. The bright light usually seems to stem from all directions as light divides.

## On Natural Light

Natural light comes in two basic kinds, namely diffuse and direct. Direct light, also known as spectral light, is made of light rays that come from the sun. The intense and

directional light forms burning rays and shadows. Diffuse light happens naturally because the rays of the sun are scattered by the atmosphere, cloud cover or greenhouse gases. Diffused light will move around objects and is non-directional. The direct rays of the sun will convert into diffused light as it goes through translucent material. The resulting effect will differ based on the kind of material where the light goes through. Every effective greenhouse will aim for full spectrum and even light.

### The Lights to Use

Foot candles and lumens can measure light intensity. Grow lights, natural light meters and light bulbs use these processes for special purposes. These measurements can define the wave lengths that can be seen by human beings. There is no direct relationship between the light used by plants and the lumens since human beings cannot observe all types of light. PAR light or Photosynthetic Available Radiation light values can measure the light that is applied on plants to trigger photosynthesis.

Direct or diffuse light do not have varied PAR values. The eyes can then notice differences in the lumens between the diffuse light and the direct light. Diffuse light will look dimmer to human beings even though the overall light transmission is not reduced.

## More Lights to Know About

White light includes all the colors of the rainbow. Every color included in the spectrum stands for a certain wave length. Within the visible spectrum, violet wave lengths are known as the shortest, while the red wave lengths are the longest. Ultraviolet rays are very short to be visible to the human eye. Infrared light is also very long for them to see. The most visible are those found at the middle of the color chart, namely green and yellow. Light found at the opposite end of the spectrum, namely red and blue light are the most productive for plants inside the greenhouse. The light that creates the most useful photosynthesis moves over the visible spectrum on the two sides of the color chart.

## Why You Need the Light

Plants cannot undergo photosynthesis if you do not have the proper type and level of light. The leaves of the plants function as solar gatherers that absorb energy from the light. Photosynthesis happens when light waves create electrons. The electrons will then cause the chlorophyll found in the leaves of the plant to start a chemical effect, when mixed with water. The atoms of carbon dioxide change into starch, thereby triggering energy for the plant, as well as change into oxygen. Diffuse light will boost the production of plant energy, since the light will bend around corners to attain the lower leaves, excluding the upper canopy.

## Greenhouse Panels - What and How Important are They?

You have to understand that every feature included in the greenhouse is very important for the overall function, so that you can get the perfect environment that will be conducive for plant growth. Greenhouse panels are among the most important elements. Temperature plays a big role in the creation of greenhouses, which is why you only need to invest in the right materials and setup that will ultimately give you the best results. Here is more info.

### What are Greenhouse Panels?

Greenhouse panels are described as solid fixtures or surfaces located at the wall, roof and floors of greenhouses to give the environment the perfect temperature that will help plants grow the best way. Some plants require more shade or sunlight compared to others, so you have to install the panels properly and in the right places, so that your plants stay healthy all-year round. Greenhouse panels can be made of different materials. You should try to determine a number of factors first before selecting the right one online or from local stores.

You can find greenhouse panels that are made of different materials. Some of the most common include wood, plastic or glass. Glass or plastic panels are the most common. These are usually lined by wooden frames or aluminum frames to last for several decades. The idea behind the installation

of panels is that your plants receive the right sunlight or shade during different times of the day and during different periods of the year.

### Looking for the Panels

You can search for greenhouse panels online. If you decide to buy a ready-made kit, you can choose from an array of available panels. The panels are available in different sizes and shapes as well, although usually, these are cut according to your specific customizations. Ready-made kits usually are pre-cut to perfectly suit the structure. You can start searching for panels online by searching for companies via search engines. You can visit web site directories to look for web sites and online discussion boards. Talk to expert greenhouse gardeners and ask them about the best and most reliable sources.

### Considering Your Crops

You have to consider which plants you intend to grow inside the greenhouse. Some plants will require more sunlight, so you should pick the right panels that allow enough sunlight in. If the plants you want to grow need more shade, you should pick panels that are solid and opaque, not allowing any light at all during certain periods of the day. Glass panels can come in transparent, translucent and opaque form, depending on your current needs.

### More on Panels

You should consider getting a combination of panels. It is quite common for a part of the greenhouse to have solid panels and another area using translucent or transparent material. The direction of the greenhouse panels will also matter, since this can reflect light better if aimed at certain angles. You should check if you want to get a lean-to design or just the regular independent greenhouse. You can check if the structure can provide enough shade during certain times if you are investing in an attached structure.

### **The Benefits of Panels**

Greenhouse panels are very important since these can provide you several advantages. The inclusions are providing the right amount of sunlight during the right times of the day, regardless of the weather outside and the time of year. You can grow plants and seeds during different seasons, thereby boosting your ability to save more in buying herbs and other kitchen ingredients. Panels help provide the right temperature so that you have the perfect environment for plants to grow excellently.

Panels are very durable and will last you as much as several decades, provided that you use only the best materials. Greenhouse panels protect your plants from external elements like strong gusts, dust, wind, rain and snow. Panels serve as a barrier as to which persons can enter the greenhouse or not.

## Comparing Products

You have to compare the different products available first before finalizing your order. Some manufacturers will give you all the details, such as the exact measurements, the thickness, the condition, grade of the material, installation, delivery or shipment and packaging. If you are building your own greenhouse, it is vital that you get the right specifications. Ask the manufacturer as well if they give additional services in terms of installation and repairs. Some manufacturers will give you warranty. You should always compare prices first. You will find that buying straight from the source will give you the cheapest cost. However, you also have to check how the product will be packaged and sent to you.

## Greenhouse Seed Propagation Tips

Watching plants grow from seedlings could be a joy not to mention good harvest, having variety, savings and in most parts, earning. Good plant propagation starts with the seeds.

### Starting the Seeds

To speed up germination, the seeds need to be soaked in hot water overnight. The seeds are then scattered +" to 1" apart over a flat plant box for germinating. The seeds are then covered with fine soil and misted over. Pots, boxes, and other seed growing mediums have to be sterilized first to

raise healthier seedlings. Cover the growing medium to reduce evaporation and to prevent the moist soil from drying out. To facilitate good germination, keep the box in a shaded area. Maintain a temperature of about 70 degrees. To better maintain the hotbed where the seeds are planted, lay out a soil warming cable under buried in 2" of sand. Care must be taken that the ends of the cable do not touch. When no longer needed, disconnect the cable. The pod of the seed has enough food for the new plant to grow. It will only need regular watering. Do not use fertilizers are at this stage.

When most of the seeds have sprouted, remove the cover, and water the sprouts with diluted all-purpose fertilizer. When the plants have developed a couple of leaves, transplant them to bigger containers.

When the sprouts are ready for transplanting, remember that transplant shock will considerably affect the plants growth. To prevent this, pick a sunny afternoon but avoid transplanting the plants under direct heat of the sun. A protected outdoor area is good for transplanting. The seeds then will gradually be exposed to outdoor temperatures a little each day. If required, there are fertilizers like Super Thrive that strengthens the young plants during its germination process thereby reducing transplant shocks.

Between one to two weeks, depending on the variety used, seedlings could grow to an appropriate size that will be time for it to be planted in their permanent outdoor location. By this time, the plants could be left in the garden without much worry except for the regular care that

is required. While in the growing stage, seedlings must be protected from frost, heavy rains, and strong winds to prevent damage. At this tender stage insecticides must be used when needed, as seedlings are prone to attack by bugs and other garden parasites.

### Greenhouse Supplies

The greenhouse, whether portable mini grow houses, hobby greenhouse kits, cold frames, and free-standing state of the art custom green houses will need the following supplies for efficient greenhouse growing.

**Greenhouse Insulation** - Aside from the glazing, the greenhouse could use insulation made of bubble sheets or poly bubbles in combination with foils and other reflective materials to reduce heating costs. Greenhouse insulation is installed inside the greenhouse glazing. Green house insulation further cuts heating costs up to 45%. Insulation increases the light inside the greenhouse aside from keeping it warmer.

**Greenhouse Heaters** - for greenhouses that need additional heat sources, greenhouse heaters are good alternatives. Greenhouse heaters could be electric or gas heaters that are ideally used when there is significant drop in temperatures that heat storage facilities inside the greenhouse no longer suffice. Heaters too come in a wide variety of choices. There are the portable heaters, wall

mounted heaters and heaters with large heating capacities ideal for use in commercial greenhouses.

**Greenhouse Thermostats** - Greenhouse thermostat are automatic controllers of the cooling and heating systems in the greenhouse. What it does is to adjust temperatures to simulate the plants natural environment. While plants need heat to grow, thermostat automatically controls temperature environments as more plants die faster when there is too much heat than when the temperature is cold.

**Greenhouse Misting System** - There are different variations of the misting system, The most common is the hand-held mist sprayer often though, this does not suffice not only due to the limitation of areas that could be sprayed at a given moment but the scope and duration that misting will oftentimes be needed especially in larger greenhouses. The misting ring, the use of humidistat, and the fogging systems are best employed for efficient greenhouse misting. Misting systems comes attached with timers for automatic engagement of mists.

**Humidifiers** - are a variation of the misting or fogging system. Humidifiers distribute humidity required by the plants inside the greenhouse thereby promoting luxuriant foliage and better plant propagation.

**Greenhouse Vent Openers** - Examples of makes are louver opener, triple vent openers, automatic vent openers, hydraulic vent openers, hinge types, solar powered, etc., because from time to time, heat must be allowed to escape

from the greenhouse to prevent the plants from withering or dying.

**Greenhouse Gardening Tools** - there are different tools that you may need depending on the scope and the type of plant that is grown. Examples are Bonsai tools, pruners, extended reach tools, propagating pots, rakes, knives, hoses, shears and snips, power tools and other tools.

### Greenhouse Ventilation - Vents and Fans

The success of a greenhouse depends largely on the efficiency of its ventilation. Ventilation allows the green house to have the proper temperature required by particular plants that are grown, it encourages pollination within the green house, it provides fresh air that are needed to aid sunlight in photosynthesis, and it prevents the infestation of pests. Aside from the usual care, when the plant and seedlings are withering or the growths are stunted, the most probable cause is improper ventilation.

#### **Vents**

While greenhouses are built to supply heat to growing plants, a little over the threshold of the plant and the plant dies or the growth is stunted. In fact many plants will die faster from heat than from cold. Installation of vents corrects the problems. The vents when located at right the proportions along the greenhouse will allow the heat to escape naturally and correct temperature conditions.

During hot climates, an evaporative cooler is needed in conjunction with the vents to maintain correct temperatures.

### Fans

The plants photosynthesize to make sugars that they use as food. Without a good airflow, carbon dioxide within the greenhouse will not be sufficient to produce the food that they need and the plants wither. While vents are essential to let humid and stale air escape, the greenhouse needs fans to conduct fresh air into the greenhouse and distribute it throughout the entire enclosure.

Outside of the greenhouse, winds, and insects causes pollination. Inside the enclosure, this will be harder to achieve without the fans to transport the pollens around. When the air inside the greenhouse moves, it will carry with it the pollens that are required by the plants for fruiting. Moving air will shake plants that are self-pollinating like tomatoes. Gentle shaking of the plants inside the greenhouse encourages the development of sturdier stems and roots thereby growing healthier plants.

Many bugs and insects thrive in fetid and low ventilated surroundings and environments. What many people do not realize is that the insects and bugs most harmful to young plants will breed faster if the greenhouse is not properly ventilated.

### Exhaust Fans

For better temperature control, exhaust fans are often mounted opposite the door. If that is not possible due to design constraints, additional circulation fans will solve the problem.

There are plants that are more heat sensitive than other plants. Usually plants that are heat sensitive are those that have delicate leaves. If so, be sure to open the vents during summer to decrease the temperatures inside the greenhouse.

### Greenhouse Watering System

When taking care of your greenhouse, you have to know that water does not come in naturally, because of the panel covering the plants and keep moisture and rain out. You have to devise the right greenhouse watering system, so that all plants get enough amounts of water regularly to grow to optimal levels. There are a number of watering systems to consider, depending on your type of setup and the plants you wish to grow. Here are tips.

#### What Plants You Need to Grow

Some plants need more water, compared to others. Others can thrive for several days or weeks without water. You have to consider the specific needs of seeds and seedlings and supply these sufficiently. Greenhouse watering systems can

be developed depending on the kind of plants that you are tendering inside the greenhouse. You can use a system revolving around a water distribution system that you purchased utilizing adjustable drip outlets. However, it is very difficult to distribute the water evenly, since the volume of the water moved is not adequate.

### Starting Off

You can use a couple of polythene sheets under the plant pots, so you can ensure that water is distributed evenly between the two points. The water is given to the base of the water via a down pipe interrupter. You can purchase the equipment and materials at your local hardware store. You can use jubilee clips to attach all the joints inside the hose from the water pump, to the greenhouse, to prevent the pipe joints from bursting.

### Gathering Water

Every structure includes a footprint, which equates to the total square footage of the external dimension. One cubic foot of water has 7.43 gallons. One cubic foot of water can fall on every square foot of the whole greenhouse on the average. To calculate water from the rainfall, you have to measure the yearly precipitation, then the total cubic feet of water for every square, the total square feet of the structure, square footage of the structure, the total gallons of water for every single cubic foot, to get the total gallons of water. For example, 12 inches of yearly precipitation is equal to 1 cubic foot.

If the total square footage of the building is 515 feet, the total gallons of water in a single cubic foot become 7.43. Therefore, the total gallons of water gathered or collected is equal to 3,830.

### Things to Consider

3,830 gallons is quite a lot. However, some of the water will evaporate or mix with snow and cannot effectively be gathered by gutters and other water collecting containers. Estimate to lose around 25% of your total calculation. You need to find a way to lead water away from the cistern once it becomes full, especially if you are located in areas with high rainfall. You should invest in an overflow pipe from the stock tank if you utilize one.

In sizing the cistern, or a holding tank located above ground, the standard rule is that the capability of the storage tank must be 33% of the total gallons of precipitation or half the total gallons calculated. There is a long time between rainy periods and rains, so you should choose the right gallon cistern that saves around 40% of the water that you gather.

### Distributing the Water to Plants

To bring the water to the plants, use a hose linked to an insulated spigot located at the base of the cistern. The

whole storage tank is a bit elevated in relation to the interior bed level, and should be positioned 1 foot higher, except for the plan to link a shed onto the part of the back well of the greenhouse to gather all the extra roof water. Raise the entire cistern one more foot to greatly boost the water pressure. The cistern can give adequate water pressure, even in its current situation to effectively give a 25-foot long, 1/2-inch diameter soaker hose, to save more water. You can get a full drip irrigation system via a T-tape.

#### **On Well Water**

Some well water can be used to boost the stock tank. Water can continue to flow from the well if the stock tank is empty. The cistern should be allowed to gather all water from rains that occur during dry seasons. Collected rainwater can be used to meet winter needs by using the collected rainwater.

#### **Guide To Buying Portable Garden Greenhouse**

A permanent structure greenhouse would be nice; that is, if you have the budget, the skill, and the space to build it. If you have at least one missing, then a portable garden greenhouse is the next best thing.

Portable garden greenhouse fits perfectly to any property

size. They may not be as large as permanent greenhouse but large enough to place a good number of plants. Some are small enough to fit even in a patio-size area. It is easy to assemble or disassemble; you can take it with you when you move to a new residence. The best thing is, it is cheap. But price and portability are not the only things you should consider when buying one. Take note of the guidelines when buying portable garden greenhouse:

Where are you going to place it? The very first step you should take when you are shopping for a portable greenhouse is to measure the available area you have for this gardening unit. You don't want to buy something that is too big or too small. Make sure that your greenhouse will fit perfectly in your property to avoid wasting effort, time, and money.

What's the temperature of your area? This will be the second most crucial step to consider. Portable garden greenhouses are not suitable for very cold weather. So if you live in an area where the temperature drops to 0 F for several months, make sure that you are ready to store the unit until the weather is more suitable.

Is there any delivery or set up fee? Unit cost piles up if you don't know how to ask the right question, so before buying a portable greenhouse, make sure that you clarify these issues first. Some stores offer free deliver but not free set up. Some offer both for free while some offer to deliver the unit and set it up for you with a cost. Check with your store first.

When do you intend to buy it? Contrary to what you might think, the best time to buy your portable greenhouse is during the warmer months. Surprised? This is because the demand for portable greenhouse is lowest during this time as the natural weather is good enough to grow plants. This is the time where stores offer discounts and special offers to you get more savings.

### How Does a Greenhouse Work?

Greenhouses have been built by individuals and gardeners all over the globe for its many benefits. You have to first understand the mechanisms used as well as the different functions and benefits that greenhouses give to make the best and most complete setup. Greenhouses can be a very worthwhile investment, provided that you understand all the details and include the different features that are applicable in your place and environment.

### **Greenhouse Background**

A greenhouse is an enclosed structure that lets light in for plants to grow well. It boosts the productivity of modern agriculture and the varieties of plants available for growing for enthusiasts and hobbyists. A hot house is described as a heated greenhouse, artificially done to grow exotic plants that need very high temperatures compared to the outside air or to grow the plants in the off-season in cold places. A greenhouse is made of a wooden frame, plastic

or metal covered with translucent or transparent material to let light in. The walls may be opaque. There may be fans to boost the circulation of air and to keep the temperature stable.

Greenhouses are usually made for plants that have special needs, aside from the existing factors and conditions present outside. For example, some people want to grow tropical plants in their temperate climate environment. They will need a greenhouse to make this possible. Several growers also use these to begin plants before the outdoor growing season begins to enhance product once the warm weather enters.

### How It Works

Solar energy is basically converted into thermal energy by greenhouses. The short wave infrared waves are entering the greenhouse and are being changed into long wave infrared waves. These cannot escape easily. The light waves simply reflect and are absorbed by the surroundings. This is the most ideal setup to grow plants excellently.

The infrared light waves cannot be seen by the naked eye. These lie between the visible light waves and microwaves inside the light spectrum. Some of the other waves are ultraviolet waves. Light waves can be measured and called nanometers. The ultraviolet or UV waves are measured at about 300 to 400 nanometers. Visible light waves are measured at around 400 to 700 nanometers. The high once are measured at around 2000 to 3500.

## About Hydroponic Technology

Hydroponics is described as the process of growing herbs, flowers, vegetables and citrus without soil. The growing medium used is water, air or a certain mixture that includes vermiculite, gravel, perlite, coconut fibers and rock wool. Hydroponic growing methods provide added yields over the board for any kind of crop. For example, tomatoes grown in 1 acre of soil will produce crops weighing around 5 to 10 tons. The same number of tomatoes grown inside a hydroponic greenhouse will produce around 60 to 300 tons.

## More on Hydroponics

Hydroponic systems are also used in greenhouses, depending on the kind of plants that growers are cultivating. The NFT or Nutrient Film Technique is a process of growing herbs and leafy flowers and vegetables. The NFT system works using rows of food grade PVC growing trays, with removable lids that include row of holes where the plants are positioned. The roots of the plants can hang in the air just under the tray with the tips resting in the water found at the tray base. The nutrient water is piped into one tip of every row. To make the setup truly successful inside the greenhouse, you may need to automate everything.

## The Light

All plants will need the right amount of light, regardless of whether these are growing hydroponically or within the soil. Several greenhouses get a lot of natural sunlight, including the needed combination of red and blue light for maximum plant growth. The fast-growing hydroponic plants, however, require supplemental light during the cold periods to keep productive growing levels. Some of the grow lights used include high pressure sodium, LED or metal halide to function well with natural light to provide sufficient levels of blue and red light to help crops grow excellently.

### **Building the Foundation**

The construction should focus on the foundation so that the entire greenhouse will last for many years to come, thereby overcoming very harsh external conditions. You should test the soil to ensure that it has enough nutrients. You should insulate the foundation using 1 to 2 inches of Styrofoam board that extends 2 feet deep all around the external edge of the foundation.

### **How Large A Greenhouse Should You Need?**

Finding the right size of your greenhouse depends on 2 most important things: the number of plants that is going into it and how much it will cost to build one. Trick is to find the biggest greenhouse size possible without breaking your bank.

## Budget vs. Necessity

When considering the cost, do not just think of the purchase price of the greenhouse itself. Your greenhouse is useless without plants, right? Buying a greenhouse is just the beginning. Usually, it doesn't come with extras like heating system, ventilation, foundation, insulation, staging, etc. You may also want an automatic watering and ventilation system which can add to the cost too.

Do not start constructing a greenhouse with a limited budget. Otherwise you may end up with either an incomplete greenhouse or a very small one.

Always remember to plan what you need, shop around, and try to get the best deal out of your money.

## Size vs. Cost

The maximum height of the plant you wish to grow should at least be the height of the greenhouse you want to build. The number of plants that is going into it should fit well to the size of the greenhouse you want to have. However, the bigger the greenhouse, the more expensive it becomes, whether you are choosing the cheapest materials or the most expensive ones. To make use of your money wisely, determine whether you need a portable or permanent greenhouse; determine the average temperature of your area; and determine if you want to keep your greenhouse throughout the year or not, as these factors will dictate the type of materials you are going to need as well as the cost of the whole project.

### **Expansion and Other Tips**

You can always start small if your budget is very limited and work your way from there. Just make sure that your original construction should have provisions for expansion and not for total replacements of all materials. From the foundation, to frames and glazing, everything should still be used once you decided to make your greenhouse larger.

Always remember to buy the best materials that can handle the weather, wind and amount of precipitation in your area. Do not pick materials based on the cost alone as this decision can prove to be more expensive in the future.

In the end, it is you that will determine the size of your greenhouse, but always remember that planning the details of your project and doing the necessary research will ensure that the money you spend is worth every dime.

### **How To Choose Which Greenhouse Materials To Buy**

A typical greenhouse allows you to extend the season to which you can grow flowers, fruits, or vegetables by 2 to 3 months. If you are a serious gardener who wants to invest on greenhouse materials and equipment, you can even grow plants all year round. Before you think of the rewards, you have to think first which materials will give you the best service against the money spent.

What exactly do you need? The type of materials to buy depends on the purpose of your greenhouse. For example, if you intend extend the growing season, the most basic materials such as film plastic for cover and wood for frame will do. If you intent to produce greens all year round, choose rigid, durable and high quality materials such as fiberglass or double-wall plastics for cover and composite or coated metal for frames. Decide if you will build a portable, semi-permanent or permanent greenhouse. Materials for portable greenhouse should be lightweight and the design should be quick set up and tear down. Materials for permanent greenhouse should be more rigid and can withstand the changing season, especially if you live in the northern part of the country. Materials for semi-permanent greenhouse should have a little bit of both.

What's the weather in your area? Thicker glazing means better insulation and most suitable if you live in lower average temperature and you want to keep your plants all year round. This is the most expensive too, averaging around \$5 per square foot. For higher average temperature, 9 cents per square foot film plastic is good enough.

How's the wind and precipitation in your area? The most basic glazing and lightweight frames are susceptible to wind. If you plan the cheapest and the thinnest film and a frame that is lightweight, a simple wind blow or snow fall can collapse the entire structure. For windy and snowy region, it is recommended to buy rigid aluminum or wood frames that are securely cemented on the ground and think glazing that can handle high winds and heavy snow.

Finally, a *caveat emptor* especially for the budget conscious: Choosing materials based on price alone can be a costly mistake. While building your own greenhouse may not be as expensive as building a house, it still requires thinking, planning, and budgeting to get most out of your investment.

### How To Store Portable Greenhouse During Winter

Portable greenhouses are free standing structures that can be assembled or disassembled and moved whenever necessary. These are relatively smaller than most greenhouses. Unlike real greenhouses that use heater to keep the environment warm during extreme cold weather, portable greenhouses rely on passive solar heat to keep temperature stable and provide a suitable environment for plants to grow.

Gardeners who live in colder climate can benefit from a portable greenhouse as it can extent growing season by at least 2 to 3 months earlier, but must be folded over the winter.

While portable greenhouses are not as expensive as real greenhouses, it is important to know how to properly store them. This is how it's done:

#### **Cleaning the Cover**

A typical portable greenhouse is made of vinyl or plastic products, which tend to break after a constant exposure to heat and cannot handle heavy weight such as broken tree limbs and snow. Once it is no longer needed in the spring or late fall, it must be disassembled to prevent unnecessary damages.

The easiest way to clean the greenhouse cover is to leave it directly on the frame itself. Mix dishwashing soap with water and use scrub to clean the plastic cover inside and out. Use cold water to rinse it off. Let it dry thoroughly before removing the cover from the frame.

### **Folding and Storage the Cover**

Once removed, fold the cover in a tent-like fashion. If you still have the original box, place it inside the box for easy storage. If not, use a rope to tie the cover securely. Store the cover in a cool and dry place like a garage.

### **Storing the Frame**

Disassemble the frame and store it during winter. This prevents the frame from catching rust and falling limbs. Make sure that the frames are clean and dry. It is good to bring out the assembly manual for easy reference, but if you don't have it, color code each coupling before disassembling it. The worst thing that will happen to you is when you have protected your greenhouse frame from rust over the winter but no longer know how to assemble and use it for the next planning season.

Portable greenhouses last for about 2 to 3 years if not properly maintained. With proper care, maintenance, and right storage during the off season months, your portable greenhouse can last indefinitely.

### How To Use Your Newly Built Greenhouse

After building your greenhouse, now what?

Yes, you put in some plants, maybe some vegetable plants to grow while everybody else has to wait until their grocery store supplies a new stock on the next harvest season. But putting your greenhouse into use is more than that. In fact, if you put few plants inside and leave them, you are just doing more damage to your plants than good, making it more of a death house for your plants. Not to mention wasting your all money on a greenhouse that doesn't serve a good purpose.

Putting your newly built greenhouse into use is not that hard. It only takes a bit of common sense and a green thumb to make plants grow. While greenhouse does its job in making plants grow, you still have to play the role of a gardener to make this thing happen.

The most common mistake novice gardener makes is not to provide proper ventilation to the plants inside the greenhouse. What happens to your body if you lock yourself

in a room that is directly under the sun the middle of summer. It's hot right? That's what happens to your plants too. Although most plants need warm temperature to grow, they cannot survive if the temperature is too hot. Hence, always make sure that you open vents, windows, screens and doors to keep the temperature regulated during a hot summer day. And keep them closed on a colder weather.

Water is another important factor to remember in greenhouse gardening. Since your greenhouse builds up moisture that the plants need, your plants do not require frequent watering, even in a hot summer day. Checking the soil will let you know if you need to water your plants.

Tropical plants obviously do not survive during winter but using a heater is often not required. But if the outside temperature drops and your greenhouse cannot maintain a warm environment, placing a heater would save your plants from frosting and withering.

Most greenhouse downfall occurs after one plant gets a disease and affects every plant inside. Treating your plant regularly with commercial or organic sprays prevents this from happening.

Using your greenhouse is not that hard. You just have to make sure that you create a good environment inside for your plants. Properly taking care of your plants and giving them their basic needs are still required even if they are in a controlled environment.

## Hydroponic Greenhouses

Hydroponic gardening is the growing of plants in water instead of in soil. To do this, the roots of the plants are anchored in inert mediums like sand, coal, or Perlite and nourished by water enriched with nutrients.

Hydroponic farming has been around for more than seventy years and has been an important part of American history. During the Second World War, due in part to limitation in the distribution and the need to have greens in the diet, American soldiers installed hydroponic units in their bases supplying them with fresh vegetables where it would not have been possible otherwise.

Hydroponic gardening allows a farmer to have complete control of the plants as far as supplying nutrition to the plants is concerned. In fact, scientists have been conducting experiments with plant nutrition to determine the effect of giving the plant a deficiency of a particular nutrient or supplying the plants with an overabundance of a nutrient to determine how it affects the plants growth.

Hydroponically grown plants have become more significant over the years. Today more than ever, the soil is contaminated with chemicals whether from the environment or from fertilizer residues that heavily affects the balance of the soil. Seldom are soil conditions ideal that

could provide good nutrition for the plants growth. With hydroponics gardening, the nutrients are supplied in the quantities that are required and in solutions that are perfectly balanced.

Hydroponic planting, being contained inside a greenhouse prevent harming the environment unlike traditional farming where runoffs from fertilized soil contaminates the soil within the farms immediate location. Water loss is very minimal as hydroponic greenhouses contain the water within the enclosure making it ideal especially in drought stricken and very dry areas to grow particular plant species. Hydroponic gardening is ideal in areas where available fertile land is limited. Growing plants inside hydroponic greenhouses makes the use of pesticides unnecessary as the greenhouse itself protects against pests and other infestation.

Lately, the commercial potential of hydroponically grown vegetables and flowers has grown in significance. More and more people are drawn to the idea of hydroponic farming that soon enough knowledge will be available for the most effective and efficient way to grow plants through this method. There are new things and benefits that are learned everyday with this type of farming that hydroponic farming has been dubbed as the agriculture mode of the future.

### Insulating The Base Of Your Greenhouse

During winter, insulation keeps cold air out and keeps warm air inside the greenhouse. During hot weather, insulation keeps the temperature of your greenhouse stable. Proper insulation prevents heat loss and does not force your heating system to work as much; hence you don't have to spend more on electric bill.

You know how important proper insulation is for your greenhouse; doing it is not that complicated too.

The principle of proper insulation is to have a building material that will be able to absorb heat from an external source, store this heat internally, and release it slowly over time. In practical terms, your insulation materials should be able absorb and store heat from the earth and the sun during the day, and release this heat slowly as the temperature dips at night.

### Materials Needed

Proper insulation requires the following materials: sand, gravel, crushed rock, insulating foam, hardware cloth, and concrete pavers. If your budget is limited, polystyrene foam can be used as an insulation. If you have a larger budget, high quality foam like PUR (polyurethane foam) or PIR polyisocyanurate foam is a great material of choice.

### Insulating The Base of Your Greenhouse

Set the ground where the foundation of your greenhouse will be placed. Spread an inch of sand on a compacted ground. Make sure that the foundation of your greenhouse is leveled.

Lay the hardware cloth to keep pests and rodents out of your greenhouse. Top this with insulating foam. Add as much foam as your budget allows. Add another layer of hardware cloth. Then spread a few inches of gravel and crushed rock and finish it off with concrete pavers.

### **Setting Up Your Greenhouse**

After the base insulation has been set, assemble the frame of your greenhouse. Make sure that the size of your base is the same with the size of your greenhouse. Otherwise, you will encounter problems with pests, rodents, and heat loss. Measure carefully the size of your greenhouse against its base before going any further.

Once the frame has been installed, you are only a few steps away to completing your greenhouse project.

To maximize insulating properties of your greenhouse, use the best materials that your budget allows. Thicker cover insulates better and lasts longer. Pick the right spot for your greenhouse depending on the type of weather you have. And finally, do not start to build without creating a plan.

### **Orchids Repotting**

Spring is a time for rejuvenation. It is a time for growth and ideal time to repot the orchids. There are times though when orchids have to be repotted spring or not. When the

orchids outgrow their containers and when the mix that the orchids are planted on is deteriorating, repotting has to be done. Deteriorating potting mix will result to orchid roots that are black and mushy. The deterioration will result in bark that easily crumbles when rubbed by the fingers. The orchid has outgrown its container when the moss that it is planted on is already compact. A compact moss holds less water limiting the activity of the roots of the orchid affecting its health.

The following are suggestions in selecting a potting material for the orchid to thrive better and longer.

You can use moss or bark. Moss and bark will breakdown overtime which is fine. You can use pumice. Pumice will not break down. If you want to extend the effective use of your potting material combine moss or bark with pumice. You can use the potting material that the orchid is growing in. The important thing to observe though is that whatever the method and potting materials used, plan the repotting so that it does not become compacted easily. Loss moss or bark will hold nutrients better and longer.

When deciding to use bark, place the bark in a container and pour in hot water (short of boiling point) and after a while, drain the water off. This will loosen bark materials as well as its surface tension. Then the bark could hold more water for the orchid. Most growers use fir bark where it is available. For aeration, add Perlite with the bark.

If you decide on moss, choose sphagnum. Sphagnum is a premium moss for the orchids. It has very long thick fibers that enable it to retain water 20 times its weight.

Before repotting, soak the roots of the orchids in water for several minutes to soften the roots and prevent it from breaking during repotting. When that is done, take a close look at the roots of the plant and cut the roots that are not plump, firm, mushy, or shriveled. Healthy roots of orchids are normally white with green tips.

Finally, the container where the orchids are to be placed must be large enough to grow the plant for as long as the medium that is used will last.

### Planning Your Inexpensive Greenhouse

It is not every day that you build a greenhouse. When you decide you wish to install a greenhouse, you will want the best and the most affordable. We say "the best you can afford" since popular knowledge teaches us that building a greenhouse is expensive. More often than not, a decent-looking greenhouse costs at least \$500 to build; and that's for the materials alone. If your skill will not take you do build one and you opt to hire a contractor, the cost will definitely go higher. Still, building a greenhouse does not have to be expensive. Take note of these tips that will help you lower the cost of your construction:

1. Design according to your need. Savings start in your design. Ideally, the smaller your greenhouse is, the cheaper the cost. Do not construct something that is totally beyond your need. The height, width, and length of your greenhouse should be just right to promote maximum growth for your plants and for you to walk around. More importantly, you want to build a greenhouse that will fit in your property.

2. Save on the frames. You don't have to spend on industrial-strength iron for your frames; they will not support an entire building. There are cheaper alternatives such as wood, PVC pipes and other plastic tubes that are durable and rot-resistant.

3. Choose your flooring. You don't have to buy bricks, tiles or lay concrete cement for your flooring. Dirt will do perfectly. Use high quality soil and lay mulch or rocks so that the water will drain right. This type of flooring is also perfect to regulate humidity.

4. Glazing and covering. You have several cheap options for greenhouse covers. Polyethylene is one. Choose thicker plastic films though, as thinner ones they tend to wear over time and you'll be finding yourself replacing the panes every year.

5. Heating, cooling and ventilation. The amount of heat you need depends on the weather condition of your location. Usually, greenhouse needs some heating device to keep the tropical temperature and humidity inside even if you are

in the middle of winter. You can orient your greenhouse so that you can save money on heating system. If your place is very hot, put your greenhouse near a tree or a large structure so that it gets shaded in the afternoon. If you live in the northern part, cover your greenhouse with blanket or some insulation so that you keep the cold air out.

Finally, think of your overall design. There are several types of greenhouses. Each has its pros and cons. See what type fits to your property, weather and budget and work your way from there.

### Portable Greenhouses

A portable greenhouse is often a miniature greenhouse for hobbyists and plants enthusiasts. All it requires is a level ground and a drain to keep it dry where you grow and culture plants the whole year round if you like.

The one thing that is great with portable greenhouses is that it could be moved around to get the best sun any season of the year. It is plant growing mobility at best. You could even transport small portable greenhouses to a relative's house if you are going out of town for a period of time. All you do is pick it up and move.

While it is true that there are many portable greenhouses

that are not really very portable as far as portability goes, there are small portable greenhouse kits designed for locations where space is an issue. It comes in all range and sizes. Apartments with terraces for example or a house with green roof designs benefits much from having portable greenhouses where flowers could be cultured and grown.

When choosing a small portable greenhouse, it is best to gather all your plants to better estimate the size of the greenhouse that is needed. It is also a good idea to measure the space where the portable greenhouse is intended to be placed to pick the right design and size as there are so many varieties that are not only practical but are good addition to prettify and add interest to a particular area. To add to this, many garden stores prefer particular designs and suppliers that each design across the country differ in detail and specifications. The good thing is you will never run out of idea when choosing. The only thing to prepare for is the choosing of the right feature that you would want to enhance a particular space whether inside the house or outside of it.

Greenhouses are not only used and designed because of some space issue. It is a good tool to augment a space in preparation for bigger projects. Small portable greenhouses are good for experimental plants but as mentioned a while back there are portable greenhouses that are designed to provide a sufficient space similar to a permanent greenhouse. The difference sometimes is that portable greenhouses are easier to assemble and disassemble depending on the current requirement of the greenhouse grower.

## Selecting a Greenhouse Design

Before you start spending on rare plants and other materials for your first greenhouse, you should first consider your needs and current situation. Do you even need a greenhouse in the first place? You will start creating the best design that is most suitable for your needs and goals as you define your specific needs and interests. You should also include your budget to prevent creating a setup that you cannot afford. Here are some expert tips.

### Considering Your Place

First of all, consider your current location and place. You should consider whether or not you want to build the greenhouse close or away from the house. Some structures are harder to wield together. You need sunshine to the fullest degree. The roof should also face south if you find the location very sunny. Choose a site that has good elevation and soil. The angle of the sunlight during noontime should around 22 degrees during the shortest day of the year. The greenhouse should also be kept over the distance of the angle from anything on the south part. Select a well-drained area and a high one, to avoid the risk of mildew. If you plant to run trellises, these should go north and south. The house should also run north and south if it is part of the structure.

## About the Shape and Frame

The kind of frame used frequently today is the modified curve eave, regardless of whether the structure is independent or lean-to. This gives you very aesthetic rooflines, sufficient side ventilation over the benches and lot of light to plants. The lean-to design may be the only one that suits certain restricted locations. Plants growing in a connected design are usually drawn or lean strongly in a single direction due to the uneven distribution of light and the limit of proper ventilation.

The most expensive one to build is usually made of aluminum frame. However, you can save more over time since you almost spend nothing on maintenance cost and repairs. Greenhouse glass should be double thick, which is usually the same as the one used in modern houses. Ground glass can also be used for exotic plants, although it is generally better to use clear glass, and rely on shade when it is needed.

## How to Keep Things Warm

The heating system is considered as the most important part of the greenhouse. The heating system of the greenhouse should give maximum capacity compared to the figures given or needed. It is important that you provide the right heat during certain times of the year. The design of the greenhouse should care for each and every plant housed inside. Therefore, some plants may be positioned at certain areas, while others may be given extra shade, based on their specific needs.

## **The Different Styles**

The lean-to design is known as the half-greenhouse, since these appear like the greenhouse has been cut into two, cut straight right at the middle. Lean-tos can be attached to houses and other existing buildings. The support and greenhouse have a common wall. The structures are generally simple, lightweight and efficient. These are attached to the house because the structure is close or has access to water and electricity.

## **Decorative Designs**

Decorative greenhouses or conservatories are known for their long and romantic histories. These were very widespread during the 19th century and stand for wealth and sophistication. Decorative designs are excellent for individuals and hobby gardeners who have already collected and grown a number of uncommon and rare plants and flowers. These are also good for conservatories and laboratories who wish to present and show to students for educational purposes. They are very popular in public buildings and private houses.

## **Building the Structure**

Cold frames and the same structures can be built as long

as you have light and air to circulate. This can be convenient because seeds can be started even before the last frost and then be replaced until the next spring. Greenhouses can be large or small, and can include jars, deep windows and tubs, depending on the objectives and goals. The floors, walls and roof can be altered and changed over time as well, depending on the current materials and the availability of space. Always consider your budget before finalizing the design. You should consult the experts first before starting the project.

### Should You Build or Buy Your Greenhouse?

Not all greenhouses are expensive so the option of building your own is always available. It is important that you understand the requirements first and determine your current situation to know if you should create your own or just buy a ready-made model. Greenhouses can be made from different materials and can have different styles, depending on your personal preference and budget. Here is some more helpful information.

#### **Building Your Own**

There are many benefits that come with building your own greenhouse. You can cut costs by sourcing out the cheapest materials. Later on, you get added financial advantages by not having to buy fruits, herbs and vegetables from the market. You can grow your own food right in the greenhouse

and even sell some of the extra for profit. The idea of building your own greenhouse is based on controlling the environment, humidity, wind and temperature for plants to grow very well, regardless of the time of year.

### Things to Consider

You can definitely save more money if you build your own model. You can expect to shell out around \$1,000 to \$3,000 if you build your own, compared to buying a model for \$5,000 to \$10,000. The opportunity to build your own greenhouse may be based on several things. Having an outbuilding can provide you with added benefits such as having more space and storage area.

The design should be realistic and practical enough for regular homeowners to handle. You can also create stronger greenhouses that last longer compared to ready-made ones. There are no specialized materials, so you can easily find materials right at your local hardware store. You can choose the glazing materials for extra durability and strength. The fans, vents and other accessories can freely be added to the design. You can grow vegetables and other plants better all-year long.

### When Building Your Own

You should do a lot of reading and research if you are to build your own greenhouse. Study a number of books and web sites that help the weekend warrior. You can get quick tips

on how to install the materials properly. There are several tips that let you treat the materials properly for added durability. Take all the needed measurements so that you build the right greenhouse that best suits your available space. Build the greenhouse according to your specific needs and space. You can choose to make a lean-to design, so that your own house can provide other factors that will ultimately help you grow the garden.

### Buying Tips

There are cold, temperate, warm and cool greenhouses, each with its own range of temperature depending on what you need. The cool ones provide less moisture to crops. High temperatures usually need more moisture as well. The water and heat level needed by your plants will determine the perfect design for you. Lean-to greenhouses are made to share the same wall with another existing structure. This usually involves your own house. You can get the advantages of being closer to heat and water.

Some of the kits you can expect to find include the Three Quarter Span, the Traditional Span and the Mansod design. The Three Quarter Span is a lean-to greenhouse having a traditional look. These very much look the same as solariums and conservatories. You should locate this greenhouse style somewhere away from direct sunlight. The Traditional Span is described as a stand-alone greenhouse that costs less and is more practical compared to other designs. This can be a cold greenhouse, in terms of design, with the presence

of irrigation and electricity to become a temperate or warm greenhouse.

### **The Mansod**

The Mansod design is described as curvilinear. The roof and side panels are slanted to provide optimal light exposure. The designs are ideally positioned in an open setting to boost exposure to reducing winter light. Other kits available may take the form of geodesic domes and alpine houses.

### **Searching and Price**

You can look for different greenhouse kits on the internet. You can talk to expert gardeners and ask them for the best sources. You should consider maintenance costs together with the price. Aluminum and wood are usually the easiest to maintain. Steel frames have to be treated each year to avoid rusting. Glass is an ideal insulator and allows more light to enter. You should consider all the materials included and determine why kits are priced as such.

---

### **Solar Greenhouse - The Active And The Passive Solar Greenhouse**

---

The principle of a solar greenhouse design is to collect

solar energy and trap it within the greenhouse and the other storage system that the greenhouse is equipped with. The heat that it is collected is stored for use during evenings and periods when the temperature is colder. Solar green houses could be adapted for most greenhouse designs like the pit, the hoop, the shed type etc. It could also be used in attached greenhouses.

There are two kinds of solar greenhouses, the active greenhouse, and the passive greenhouse design.

### **The Active Solar Greenhouse**

Generally, active solar greenhouses are freestanding greenhouses aimed at commercial production where solar energy is used as supplemental source of heating. To make the solar greenhouse collect optimum power, the length of the greenhouse is oriented along east to west axis. The south sidewall of the greenhouse is glazed to collect and store the most heat while the north-facing wall is insulated or painted with a reflective material to prevent the escape of the heat collected. The west- east orientation could be changed to some degree as different localities could receive small degrees of variances in its orientation to the sun. Nonetheless, this construction is typical as orienting one wall to the south enables the greenhouse to receive maximum solar energy exposure.

Active solar greenhouses are designed to get the most heat especially during cold months. Its angle of glazing is constructed perpendicular to the rays of the sun. Once heat is collected the heat is trapped by the glazing preventing

much of the heat from escaping from the greenhouse. Active heating involves the use of thermal storage and subterranean heating within the greenhouse. Pipes are used to force solar heated air, phase change materials, or water buried in the floor for storage and distribution of heat. The system of pipes work by drawing hot air in the roof that is then conducted into the tubing's that are buried in the floor of the greenhouse which is then dispersed throughout the enclosure.

### **Passive solar Greenhouse**

Passive solar greenhouse on the other hand is ideal for use by small growers. Since the passive solar type does not need mechanical pumping and piping systems, the passive greenhouse is cost effective and is easy to maintain. Passive solar heating is collecting and distributing heat through efficient heat storage systems. Heat storage could be done through heat storage vaults or could be done simply through a south facing window that is shaded in the evenings to prevent heat loss.

### **The Benefits of Greenhouse Gardening**

Adding a greenhouse in your garden was once thought as a luxury, since it is expensive to build and its purpose is to produce crops during seasons when they cost relatively expensive. Now, they are becoming more of a necessity for anyone who wants to produce crops or grow plants even during dead winter. Read on for more information about the benefits of greenhouse not just for a private gardener, but for

professional gardener.

The most significant advantage of having a greenhouse is having a piece of land that is always perfect for planting regardless of time and season. In traditional planting, it has often been warned that the land is to be left idle once after every six years of planting to enable the land to recover the nutrients lost. It never happened. The result was over fertilization of the soil that the land may actually have lost most, if not all of its nutrients enough to grow and harvest a decent crop. The long and short-term effect of it is that what is grown are chemically induced plant produce that is not only lacking in nutrients, it made the land unusable if not for the chemical treatments. With greenhouse gardening, the nutrients given to the plant could be completely controlled yielding healthier crops without harming the soil from fertilizer runoffs.

Some crops need more heat than other plants. Greenhouse temperatures are controlled to precisely grow plants even of varieties that have never been grown in the area. This is particularly beneficial to people living in cold climates where winters could be as long as five months and where most plants could not grow. Growing plants in a greenhouse makes it possible to grow crops whole year round if need be.

Greenhouse gardening are excellent nurseries for protecting delicate and exotic seedlings and young shoots but more than that, it is a good place to experiment and develop crop production. With greenhouse plants, it is possible to grow healthy organic foods free from

fertilizers and pesticides.

Greenhouses make it possible to sell vegetables and other plants off-season where particular crops could typically be very expensive, if not unavailable. Greenhouses are a good idea to augment land use as well. Perhaps the greatest single benefit that is derived from greenhouse crop planting is its future use in sustaining a continuously growing population that in like proportion has decreased the availability of land to be used for agriculture that otherwise should be sustaining them.

### Water and Ventilation Systems for Greenhouse Plants

Greenhouse plants have special requirements to stay fresh and healthy. They need a constant supply of water and good ventilation, among other things. This can be easily fulfilled if you are working in your greenhouse every day. But even the most diligent farmer gets tired too and may not fulfill his daily duties as faithfully as he wants. Hence, automated watering system and the knowledge of providing proper ventilation come in handy.

#### **Water System**

If you have the budget, there is no reason not to get one for your greenhouse. There are your options:

**Overhead sprinklers** - The name speaks for itself, overhead

sprinklers provide water supply to your greenhouse plants in the form of mist or rain-like spray. The good thing about this system is that it equally distributes water throughout the greenhouse make sure that your floor and benches can withstand constant wet condition.

Weeping garden hose - This water system is one of the most ideal choices for your greenhouse. A Weeping garden hose releases small amounts of water continuously in a very slow rate through water plastic tubing that are directed into the soil.

### Ventilation System

Too cold and your plants will freeze; too hot and your plants will toast. This is the dilemma, most gardeners encounter after building their very first greenhouse. How can you ensure that the temperature is just right for your plants to grow healthy? Aside from taking care of your plants daily, creating ventilation system is your best answer. Ventilation system helps draw hot air out if it needs to and take hot air in if the greenhouse is too cold. Manually opening and closing vents work fine, but when you are not around or if you don't know what should be the right temperature for your plants to grow, you need to build an automated ventilation system. This is composed of an electric motor that is attached to a thermostat that sends the signal for the vents to automatically open or shut as necessary. Installing fan is simple, yet very effective way to aid the ventilation process. During winter, installing a heating system would help your greenhouse to stay warm and keep plants growing.

Water and ventilation systems are a good investment for your greenhouse. They help you make gardening less tedious and help your plants grow better even if it is freezing cold outside or if you are in the middle of summer.

### What are the Benefits of Greenhouse Gardening?

You may be wondering why people have to create greenhouses to grow plants and gardens when they may do well on a plain setting. Greenhouse gardening has become very popular since it provides several benefits that will lead to greener and healthier plants. You may be surprised to know that you can make your own greenhouse garden at a fraction of the cost you expect. You have to do some research first to get ahead. Here are some more tips.

### What is a Greenhouse?

A greenhouse is described as a structure that makes a protected setting for plants to grow well. These extend the health and lives of plants. The process can be a very effective and fun way to keep and maintain your garden regardless of the time of year. You can grow herbs and vegetables even while it's snowing outside. There are several reasons why you should invest in a greenhouse. You can primarily do things inside a greenhouse, which you cannot normally do if you were on a basic garden setup.

## Starting the Greenhouse

Some of the reasons why you should start a greenhouse garden include carrying over plants that can be used as greenhouse plants in the next season. You can start earlier for tender plants that began as seeds. You can boost the possibilities of a bigger variety and nonstop supply. You can culture small vegetables more conveniently for winter use. You can experiment and propagate using various plants to amuse yourself. You can grow and develop new kinds of plants.

## Describing the Benefits

Plants cannot move from one place to another like animals. These have to receive food from sunlight. Plants need to get nutrients from the soil using capillary action. The water will go up the roots against the pull of gravity. The roots will then receive water, plus other nutrients in the soil, as the leaves get more water and sunlight to do a variety of processes.

Sunlight is used by the plants to get energy. Photosynthesis is described as processing light to be used to make more nutrients for plants to maintain good health. The greenhouse provides advantages since its walls and roof are made of translucent plastic and glass. You can view the sunlight entering the greenhouse in a unique way. Sunlight is composed of different light waves. Some are invisible, and the glass in greenhouses can allow some waves to enter and some to stay outside.

## **Added Benefits**

The resulting effect is that the environment inside will be hotter compared to the outside environment. Plants and flowers can grow well even during winter. Greenhouses are then referred to sometimes as "hothouses" because of these effects. You can save more since you can plant straight from seed form as the year begins. Growing plants from seeds is generally cheaper compared to buying small plants from nurseries.

Not all plants are nurtured and grown by nurseries, so you may be interested in growing uncommon herbs and other plants. A food lover can easily grow fruits and vegetables via a greenhouse. Some vegetables can grow very well in small containers such as tomatoes, peppers and lettuce. You will ultimately save more by not having to buy some of these commodities in the market or grocery store. Plant more as the year passes to sell and gain more income.

## **Saving Time and Money**

Remember that the temperature inside a greenhouse can reach up to 40 degrees Celsius warmer compared to the external environment. You will then get a shading effect. The biggest area of the roof should be presented to the south. You will then get shade majority of the setup during extra hot periods like summer and a lot of sunshine during the cold months. Building a greenhouse will help you save more time

and money. Instead of waiting several months before you can grow certain herbs and plants, you can now grow them immediately. You can expect these plants to stay healthy regardless of the season.

### **Winter Months**

Some countries experience very long winter periods, lasting 5 months or more every year. The benefits of a greenhouse can be very significant especially for people living in cold climate areas. Greenhouses also let you grow plants all-year round. These give you a warmer mini-climate for plants that do not usually grow in your zone. You can cultivate a variety of plants that are unique to your place.

During the very hot months, you might need a shade cloth. You can start planting vegetables straight from seeds early in the year. You can start your own business selling plants, herbs, fruits and vegetables which you have grown earlier than others who do not have a greenhouse. You can make more money by having some space inside the greenhouse rented by people who want to grow rare and uncommon plants.

### **Winterizing the Greenhouse**

The best season to prepare the greenhouse for winter is every fall. A word of caution though, no matter how well the greenhouse is winterized, there will often be

unexpected things and needs that will arise. To better prepare for this, have an extra winter shield, a backup heater and keep a checklist handy when working on the winterization. Emergencies like power failure can happen. For this, gas or propane heaters and battery powered temperature alarm will be handy. If you are located in areas where freezing cannot be avoided, drain all water lines before the frost sets in. Except for some tropical plants, most plants could survive and even get some protection from cold temperatures with a coating of ice.

When working on winterizing the greenhouse, include in the to do list the following:

#### Heat insulation and conservation

The one thing that the greenhouse will need most during winter is heat. Replace then all ageing poly cover and broken glass. Airtight the doors and vents by applying foam tapes. Caulk also if needed. To make heat conservation more efficient, install bubble-sheet insulators. Bubble insulators are very efficient; it cuts down heating cost by as much as 45%. If upgrades are needed, this is the best time to do that. Most garden stores have sufficient inventories during this period and will supply whatever is required including the cutting to size sheeting, glazing, and other greenhouse needs. All you need to do is send them dimensions and sizes preferred.

#### Insure that the heater is in good condition

Check the heater for efficiency. Replace all worn down parts and parts that are showing wear and tear. All components

in the heater should be in good shape as there is nothing more bothersome than running a greenhouse in winter with a defective or insufficient heater. The heater should run well in the lowest as well as in the highest temperature settings. Variations and deviations in temperature must max at 4 deg. F. more than that and the heater must be investigated.

### Clean

This is the best time to clean house. Take all the plants out of the greenhouse. Clean the greenhouse and all its components and parts including benches and glazing with warm water and household detergents. Disinfect the greenhouse and repaint frames with latex paints. Algae spots are washed easily with household bleach. After that, apply oil to hinges, metal frames, couplings, and vents.

### Growing Green House - Cheap Greenhouse

You do not have to be a pro builder to build your own greenhouse; you simply need to know the proper information and then take action. Using a few these will get you pointed in the right direction.

Gardening is an excellent activity lots of folks have taken nowadays. Growing green house is how it could be done. To begin with building a hothouse, you just want to make a few changes on your land because nearly all houses have a backyard or a front lawn.

To start building a greenhouse, first thing needs to be done is analyze the section where it will likely be. Attaching a hothouse to the residence is a great idea if there may be not much room to construct a stand alone version. A greenhouse should have sufficient sunlight for those plants and shade once it gets too hot.

For the area in the environment with hot summers and freezing winters, install a heater and a ventilation system in the green house. For small greenhouses, a heater may be powered by electrical energy. But for a larger area, use oil or gas to power the equipment.

Utilize the right kind of panels for the greenhouse. This is another method of giving the plants enough space to grow. Usually, glass panels do the job. But latest reports have shown the glass passes excessive sunlight that is sometimes damaging for the plants. Using panels made of plastic, film, or Plexiglas is a significantly better solution.

The greenhouse can later on be improved to not just have soil but in addition have water at all times that may increase the plants development. Farmers do that often to improve crop growthComputer Technology Articles, and this practice is called hydroponics farming.

Growing green house does not always must be done by an expert. There is plenty of information offered to construct your own green house. Looking at gardening magazines or

searching over the Internet may give you an idea about the type of the greenhouse that is best in your case.

### **Resources**

**Building A Greenhouse Plans:**

<http://tinyurl.com/jww873f>

**Good Luck in building your greenhouse, don't forget to have fun too!**

**Thank You,**

**Terry Clark**

